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The Long Shadow of Police Racial Treatment: Racial Disparity in Criminal Justice Processing

Abstract: *This article explores racial disproportionality in criminal justice processing in an era of punitive criminal justice policies and mass incarceration. Using arrest data from New York State, the authors compare the racial disparity in prison sentencing with the disparity at arrest while controlling for crime type and criminal history of the arrest population. Findings show that the racial disparity in prison sentencing at the state level is established before courts begin criminal case proceedings. Scholars and policy makers interested in the sources of racial disparity in incarceration should concentrate on the processes that generate crime and arrests. However, a decrease in racial disparity at prison sentencing, relative to arrest, suggests that the practices of courtroom actors still merit scholarly attention.*

Practitioner Points

- The racial disparity that exists at prison sentencing is, for the most part, already in place at arrest. This implies that the effect of law enforcement practices at arrest is a major source of minority overrepresentation in prison.
- A decrease in racial disproportionality between arrest and prison sentencing between 1990 and 2010 suggests that courtroom actors can mitigate disparities that exist at arrest.
- Large regional variations in the extent of racial disproportionality emphasize the importance of understanding criminal justice processing at the local level and encouraging the independent efforts of local criminal justice actors to ensure that their own practices do not exacerbate racial disparity.
- Institutional efforts to keep reliable records on policing activities involving arrest will help us understand whether and how racial disparity at arrest is initiated.

The disproportionately high incarceration rate among African Americans raises the concern that the American criminal justice system is treating people differently based on race and leads to the question, at what stage of criminal justice processing does this disparity culminate? The racial disparity in the incarceration rate is much higher than the racial disparity at arrest. For example, in 2010, the arrest rate for blacks was twice the rate for whites, while the incarceration rate for blacks was seven times the rate for whites (Glaze and Parks 2012). Pettit and Western (2004) also estimated that the cumulative risk of imprisonment for black males was more than 20 percent among those born in the 1960s, while only 3 percent of corresponding white males were at risk of incarceration. This difference in the racial makeup of the arrest and incarceration populations implies that there is differential treatment of defendants in the criminal justice system by race, either by way of discrimination or through formal mechanisms in response to different crime patterns.

Previous research on racial disparity in prison sentences has focused only on the back end of the criminal justice process, most notably, sentencing after a plea or trial (Wooldredge et al. 2015). Although there are conflicting findings on the influence of a defendant's race on incarceration decisions, studies have found a small but significant effect of race on either the decision to incarcerate or the length of the prison sentence if incarcerated (Rehavi and Starr 2012; Spohn 2008; Stolzenberg, D'Alessio, and Eitle 2013). Given the small magnitude of the effect of race on sentencing, scholars have concluded that discriminatory sentencing practices, if any, may not be the major driver of minority overrepresentation in the prison population (Mitchell 2005; Wooldredge et al. 2015). Although examining the effect of race on sentencing decisions is both meaningful and necessary, it is important to understand differential system treatment from a more holistic view by recognizing a series of decision points that precede the sentencing decision (Baumer 2013; Zatz 2000). An incarceration

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decision is the result of accumulated decisions involving law enforcement officers, prosecutors, and judges. This suggests that the overrepresentation of racial minorities in prison should also be the product of accumulated differential system treatment through several decision points in case processing, and not only the sentencing decisions made after conviction (Baumer 2013; Zatz 2000).

Institutionalism perspectives broadly predict that the behavior of actors within an institution is determined by the formal and informal guidelines of that institution (Amsler 2016; Epp, Maynard-Moody, and Haider-Markel 2017; Galanter 2004; Kramer and Ulmer 2002; Nardulli, Flemming, and Eisenstein 1985). These guidelines may be rules and laws that explicitly determine action or, more informally, professional norms and pressures set by tradition or the working environment (Epp, Maynard-Moody, and Haider-Markel 2017; Eterno, Barrow, and Silverman 2017). In this article, we pay attention to the two institutions of policing and criminal courts, where the decisions of actors in each institution are influenced by different formal and informal guidelines, and how these guidelines may determine the long-term results of policing practices on eventual criminal sentencing. Our findings suggest that disparate arrest rates brought about by differential treatment of races by police, either from outright discrimination or from differences in crime patterns, survive mostly intact through the court system, which suggests that the institutional features of courts serve to enable this effect.

An analytic approach developed by Alfred Blumstein (1982) can be useful to explore the dynamics between institutions and how institutional practices at the later stages of case processing could be influenced by other institutional practices at earlier stages. Blumstein introduced an innovative approach to measure the extent of accumulated differential treatment throughout post-arrest stages. Accounting for racial differences in the arrest-crime distribution, the Blumstein estimates measure the extent to which the racial composition of the inmate population is explained by the racial composition of the arrest population. The residual that is unexplained by racial disparity at arrest can be a proxy for the extent of differential systemic treatment based on the race of defendants throughout case processing. Using this approach, studies (Blumstein 1982; Crutchfield, Bridges, and Pitchford 1994; Langan 1986) in the 1980s and 1990s found that most of the racial disparity (76 percent to 97 percent) in prison was explained by differential involvement at arrest, while the remaining variation, which was the measure of differential treatment by courtroom actors, was relatively small.

However, these earlier studies suffered from several important limitations, namely, that they used aggregate statistics and did not control for important factors of racial disparity in prison. Furthermore, there has been increasing concern over racial discrimination, especially in recent years, characterized as greater punitiveness in arrest and incarceration policies for certain types of crimes (Beckett, Nyrop, and Pfingst 2006; Steen, Engen, and Gainey 2005; Tonry and Melewski 2008). The most recent study by Tonry and Melewski (2008) reaffirmed this concern, finding that the extent of unexplained racial disparity had increased to 40 percent. The authors pointed to a substantial change in drug policy as the main driver of increased racial disproportionality between arrest and incarceration. For the last 30 years, the proportion of black arrestees for drug offenses increased dramatically compared with that of white arrestees, with the disproportionate concentration of police efforts on crack cocaine and drug trafficking on the street considered the primary mechanisms (Tonry and Melewski 2008).

New York State experienced dramatic policy change during this time. Beginning in 1978, the proportion of drug crimes among felony arrests increased dramatically and remained around 30 percent until 1998.[1] During this period, the New York State incarceration rate also increased dramatically; almost half of the increase was due to drug commitments (Drucker 2002). Following this period of increase, the New York State incarceration rate dropped almost 25 percent since 1998. To our knowledge, no previous studies have examined whether racial disproportionality in justice processing increased or decreased during this period. In this article, we attempt to fill the gap in previous research by examining the extent of racial disproportionality, which is a proxy for differential treatment at post-arrest stages of processing. Using 20 years of state administrative data, which include detailed case processing information for the entire New York State arrest population, we explore the time trend of the racial disproportionality between 1990 and 2010, as well as regional variations. Moreover, we advance the Blumstein method by using administrative data from rap sheets. This approach has two main advantages. First, we conduct the analysis on the same people from arrest to incarceration—which eliminates strong assumptions required when using aggregate data, as previous research has done. Second, because we follow the same individuals through the system, we can incorporate criminal history into our analysis, which is one of the most important predictors of differential treatment in criminal case processing.

Institutional Interaction between Law Enforcement and Courtroom Actors

Policing and courts form the front and back ends of criminal processing and are institutionally different systems that both contribute to the racial composition of the eventual prison population. Lipsky (2010) identified police officers as street-level bureaucrats with the ability to influence policy outcomes at the incident level. Rules and procedures exist to protect against racial bias in policing, but such structures rarely constrain the heat-of-the-moment decisions that police officers must make. On the other hand, courts resolve cases bureaucratically, with courtroom actors negotiating with one another from various interest points and defendants, prosecutors, and judges working to resolve the inherent conflicts in their objectives (Flemming, Nardulli, and Eisenstein 1992). Decisions made by courts are limited by administrative rules and by informal norms, which help determine sentencing outcomes for each defendant.

To illustrate, consider New York State law, in which the minimum sentence for a violent B felony (e.g., manslaughter in the first degree or robbery in the first degree) is five years with no prior criminal history and 10 years with a violent prior conviction, while less serious nonviolent E felonies (e.g., rape in the third degree or computer trespass) range from no jail time for first convictions to a possible three-year prison sentence with criminal history

(New York State Penal Law §2.E.70). Such guidelines give formal rules for sentencing given specific criminal patterns and histories, with statutory enhancements further determining outcomes (i.e., for crimes involving firearms). It is also established that courts have "going rates" for certain common crime patterns, which also informally guide outcomes by what court actors mutually believe is the appropriate outcome for a given crime, especially the plea-bargained cases that make up the vast majority of all criminal dispositions (Galanter 2004; Kramer and Ulmer 2002; Nardulli, Flemming, and Eisenstein 1985). For example, the "going rate" for a first-offense robbery in the first degree will have a commonly understood plea deal that all court actors (defense attorneys, prosecutors, and judges) recognize as standard procedure.

Courts, in contrast to police, are institutions with formal and informal structures in place that limit the discretion of actors within, through formal law and administrative rules, inherent barriers of multiparty negotiation, and shared expectations about outcomes (Schmidt 2010). Understanding this about courts gives insight into how differential treatment by race at arrest can have a far-reaching impact on sentencing and why courts as an institution preserve policing outcomes. Namely, the limited discretion of court actors relative to police helps preserve arrest patterns through to sentencing and may serve to limit the differential treatment that courts may impose (either to correct for potential bias by police or to further it).

Blumstein's Approach to Measuring Net Differential System Treatment

Blumstein (1982) suggested an interesting approach to measure the degree to which minority overrepresentation in prison can be attributed to differential treatment by courtroom actors. He estimated the proportions of black and nonblack arrestees that are expected to be sentenced to prison when there is no systematic difference in case processing by courtroom actors. Then he compared the expected ratio of black-to-white incarceration based on arrest patterns to the actual ratio of black-to-white incarceration. In a hypothetical situation in which there is no racial discrimination in the post-arrest stages, the black-to-white arrest ratio and the black-to-white incarceration ratio would be the same. However, it is important to note that important confounding variables exist that may legitimate differential treatment, and direct comparisons of arrest and prison racial proportions can be misleading.

Blumstein (1982) controlled for the racial difference in the distribution of crime type, as this is an important legal factor that affects the probability of a prison sentence (Johnson 2006; Ulmer and Johnson 2004; Wooldredge et al. 2015). For example, an individual who is arrested for homicide would have a higher chance of receiving a prison sentence than one arrested for petty larceny. If racial minorities are more likely to be arrested for serious crime types than the rest of the population, the higher incarceration rate of racial minorities would not be the result of discrimination against minorities but rather the system reacting to the different crime distributions. Using aggregate-level national arrest and incarceration statistics, Blumstein (1982) found that 80 percent of the racial disparity in the prison population was explained by differential criminal involvement between racial groups. He suggested that the overrepresentation of racial minorities in the prison population was largely explained by what happened prior to the decisions points of courtroom actors (e.g., individual criminal behavior and police behavior).

Over the last 30 years, Blumstein's study has been replicated by other researchers (Blumstein 1993; Crutchfield, Bridges, and Pitchford 1994; Langan 1986; Tonry and Melewski 2008). All subsequent studies used different data sets, target populations, and time periods, with minor modification of the analytic methods. However, all those replication studies used aggregate-level statistics from two separate data sources for prisons and arrests. The most recent study by Tonry and Melewski (2008) replicated Blumstein's original study using 2004 national arrest statistics and found that only 61 percent of the racial disparity in incarceration was explained by racial differences at arrest. Their findings increased concern about whether the extent of differential system treatment in the post-arrest stage is increasing.

Several limitations of this research are noteworthy here. First, case processing time might differ by offense type and by race, and therefore using the aggregate-level arrest and incarceration counts from different data sources might produce less accurate indicators of underlying annual trends. Second, the use of aggregate-level statistics makes it harder to account for other legitimate factor(s) that might influence how criminal justice actors treat individuals arrested for a crime. For example, the criminal history of an arrestee is one of the strongest predictors of sentencing, such as the decision of whether to incarcerate a defendant and for how long to incarcerate him or her (Mitchell 2005; Wooldredge et al. 2015). Differences in criminal history distributions between racial groups might also be an important factor to explain racial disproportionality between arrest and incarceration processes. Third, none of the previous studies explored the regional variation below the state level. There is a large variation in terms of crime characteristics (e.g., arrest rates and crime distribution) and other regional circumstances (e.g., racial diversity, local economy, criminal justice resources), which might be related to case processing. Examination of racial disproportionality at the state level might mask such regional variation.

Acknowledging the limitations of previous studies, we attempt to advance the Blumstein estimation method using administrative data from New York State. First, we obtain the Blumstein estimates for the state arrest population using individual-level data that include details of case processing (e.g., arrest, arraignment, conviction, incarceration, and disposition). This allows us to use information on prison admission from the same sample of individuals used in the arrest stage. We also focus on prison admission (the flow into prison) by using the number of defendants sentenced to prison among arrestees in a given year. Second, taking advantage of information on individual arrestees, we examine whether the black and nonblack arrest populations differ in their criminal history distribution and incorporate the criminal histories of arrestees to obtain an estimate of differential system treatment. Third, we explore the time trend of the Blumstein estimates by obtaining separate estimates for single years between 1990 and 2010 in New York State. By examining the trend in the estimates over those 20 years, we test whether the differential system treatment has worsened, a concern that has been raised by other scholars (Tonry and Melewski 2008).

Data

We use the New York State Computerized Criminal History (CCH) analytic file, provided by the New York State Division of Criminal Justice Services, which includes all fingerprintable arrest records that occurred in New York State from 1990 to 2010. The CCH data set includes demographic information about each arrested individual, including date of birth, sex, race, and ethnicity. It also includes details of case processing such as jurisdiction and date of arrest, conviction, and disposition; charge details at arrest and conviction, including UCR (Uniform Crime Reporting) offense category; and sentencing decisions. For regional analyses, we grouped the state's 62 counties into three regions: New York City counties, IMPACT counties, and other rural counties not included in the first two groups.[2] The IMPACT counties refer to 17 urban counties that account for 80 percent of the index arrests outside the New York City region and have characteristics independent of rural counties and the five boroughs of New York City.

Analytic Strategy

The Blumstein estimate (hereafter referred to as X) measures the degree to which the racial composition of the prison population is explained by racial composition at arrest (equation 1). The basic assumption behind the estimation is the proportionality in racial composition between the arrest and prison populations. If the race of an arrestee does not play a meaningful role in case processing, we would expect to observe the same racial composition at prison that we do at arrest.

$$X = \frac{Ratio\ of\ Expected\ Black\ to\ Nonblack\ in\ Prison\ Sentencing\ Population}{Ratio\ of\ Actual\ Black\ to\ Nonblack\ in\ Prison\ Sentencing\ Population}$$

$$= \frac{Ratio\ of\ Black\ to\ Nonblack\ in\ Arrest\ Population}{Ratio\ of\ Black\ to\ Nonblack\ in\ Prison\ Sentencing\ Population}$$

$$= \frac{\frac{Percentage\ of\ Black\ in\ Arrest}{Black\ Population} / \frac{Percentage\ of\ Nonblack\ in\ Arrest}{Nonblack\ Population}}{\frac{Percentage\ of\ Black\ in\ Prison}{Black\ Population} / \frac{Percentage\ of\ Nonblack\ in\ Prison}{Nonblack\ Population}}$$

$$= \frac{Percentage\ of\ Black\ in\ Arrest\ /\ Percentage\ of\ Nonblack\ in\ Arrest}{Percentage\ of\ Black\ in\ Prison\ /\ Percentage\ of\ Nonblack\ in\ Prison}$$

$$= \frac{R/(100-R)}{Q/(100-Q)} = \frac{R/(100-Q)}{(100-R)\ Q}$$

Here, X is calculated from the expected ratio of black to nonblack divided by the actual ratio of black to nonblack in prison sentencing. Thus, X would equal 1 when the ratio of black to nonblack defendants who were sentenced to prison is exactly the same as the ratio of black to nonblack arrestees. This suggests that the extent of net system treatment based on the race of a defendant during post-arrest case processing is zero. When X is smaller than 1, it shows the proportion of the racial disparity in prison population that is explained by differential involvement at arrest. For example, a Blumstein estimate of 0.8 indicates that 80 percent of the racial disparity in the prison population is explained by differential involvement at arrest. The remaining 20 percent is the extent of differential system treatment in post-arrest case processing and indicates that post-arrest case processing is favorable to nonblacks. On the other hand, if X is greater than 1, it means that the ratio of black to nonblack defendants who were sentenced to prison is smaller than the corresponding ratio in the arrest population and that system processing is favorable to blacks.

Crime distribution of each racial group at arrest should be accounted for in the estimation. As represented in table 1, blacks are more likely to be arrested for crimes such as robbery, assault, drug sale, and drug possession, which often have higher probabilities of receiving a prison sentence. On the other hand, nonblacks are more likely to be arrested for crimes with lower probabilities of receiving a prison sentence, such as basic property, DWI/DUI offenses, and other crimes. To account for the racial differences in the crime type distribution, the Blumstein method breaks up arrests into different crime categories and calculates the percentages of blacks and nonblacks multiplied by the proportion of each crime category in prison. These numbers indicate the percentages of expected blacks and nonblacks in prison sentencing based on the crime distribution at arrest. In the current study, we use 11 crime categories to account for the seriousness of offenses committed by black and nonblack offenders: (1) homicide, (2) robbery, (3) basic property, (4) drug sale, (5) drug possession, (6) burglary, (7) assault, (8) fraud, (9) driving offenses, (10) sex offenses, and (11) other.[3]

Table 2 shows an example of how to get the Blumstein estimate using the 2010 arrest sample in our data set, which is the measure of racial disparity in the arrest population accounting for the crime distribution. For each crime category, the percentage of blacks in arrest (B_j, where j refers to each crime category) is multiplied by the distribution of each crime category in prison (F_j). This returns the

Table 1 Crime Distribution at Arrest

Crime Type	Total	Black	Nonblack
Homicide	0.3%	0.4%	0.3%
Robbery	3.5%	5.2%	2.3%
Burglary	2.6%	2.4%	2.8%
Basic property	13.7%	13.1%	14.1%
Assault	16.2%	17.2%	15.7%
Sex offenses	2.2%	1.9%	2.4%
Drug sale	5.8%	7.7%	4.6%
Drug possession	16.9%	21.6%	14.0%
Driving offenses	9.2%	2.0%	14.0%
Fraud	8.8%	9.8%	8.2%
Other	20.3%	18.4%	21.7%
Total	100.0%	100.0%	100.0%

Table 2 Estimating Percentage Black in Prison Assuming No Post-Arrest Discrimination, 2010 Arrest Cohort

	(B_j) % Black Arrest	(Q_j) % Black Prison	(F_j) Crime Distribution in Prison	(R_j) Expected % Black Prisoners
Homicide	56.3%	57.9%	0.034	1.9%
Robbery	60.0%	61.2%	0.147	8.8%
Burglary	34.7%	37.4%	0.134	4.6%
Basic property	36.3%	39.8%	0.067	2.4%
Assault	42.7%	51.1%	0.098	4.2%
Sex offenses	39.0%	39.4%	0.024	0.9%
Drug sale	51.2%	52.6%	0.156	8.0%
Drug possession	47.4%	51.9%	0.110	5.2%
Driving offenses	12.7%	12.1%	0.031	0.4%
Fraud	48.7%	42.3%	0.024	1.2%
Other	39.7%	52.2%	0.175	7.0%
Overall	**40.6**	***Q*=49.0**		***R*=44.6**

Expected ratio of black to nonblack = $R/(100 - R) = 80.6$.
Actual ratio of black to nonblack = $Q/(100 - Q) = 96.2$.
***X*=0.84**.

percentage of expected black prisoners for a given crime category based on the arrest distribution (R_j). By summing up the expected percentages of blacks for all crime categories, one can obtain the total percentage of expected black prisoners ($\sum R_j = R$). In the example of 2010 arrest population, 49.0 percent of the prison population is black, while 40.6 percent of the arrest population is black. However, when accounting for the crime distribution of each race group ($B_j^*F_j$), 44.6 percent of the prisoners are expected to be black, which is about 4 percentage points greater than the overall black arrest proportion (40.6 percent).[4] The final Blumstein estimate is calculated by dividing the ratio of expected blacks to nonblacks in prison (R/[100 – R]) by the ratio of actual blacks to nonblacks in prison (Dixon 1995), where Q refers to the actual black percentage in prison). The final Blumstein estimate is 0.84 (80.6/96.2), which means that 84 percent of the racial disparity in prison is explained by the arrest pattern.

We additionally account for the criminal history distribution in our estimation, as the number and the seriousness of a defendant's prior records are strong predictors of prison sentence (Johnson 2006; Ulmer and Johnson 2004). Table 3 shows that blacks and nonblacks in the arrest population have different distributions of criminal history. Overall, one-fourth of black arrestees in our sample had one or more felony convictions in the past, which is about twice the corresponding proportion for nonblack arrestees. On average, black arrestees were more likely to have a longer or more serious criminal history. We incorporate criminal history into the estimation using five criminal history categories: (1) two or more felony convictions, (2) one felony conviction, (3) any misdemeanor conviction but no felony conviction, (4) arrest priors but no conviction history, and (5) no criminal history of any kind. In combinations of crime categories and criminal history, we calculate the Blumstein estimate using 55 groups, which allows us to control for both crime seriousness and criminal history, which we consider the two main legitimate factors in prison sentencing.

Table 3 Criminal History Distribution, 2010 Arrest Cohort

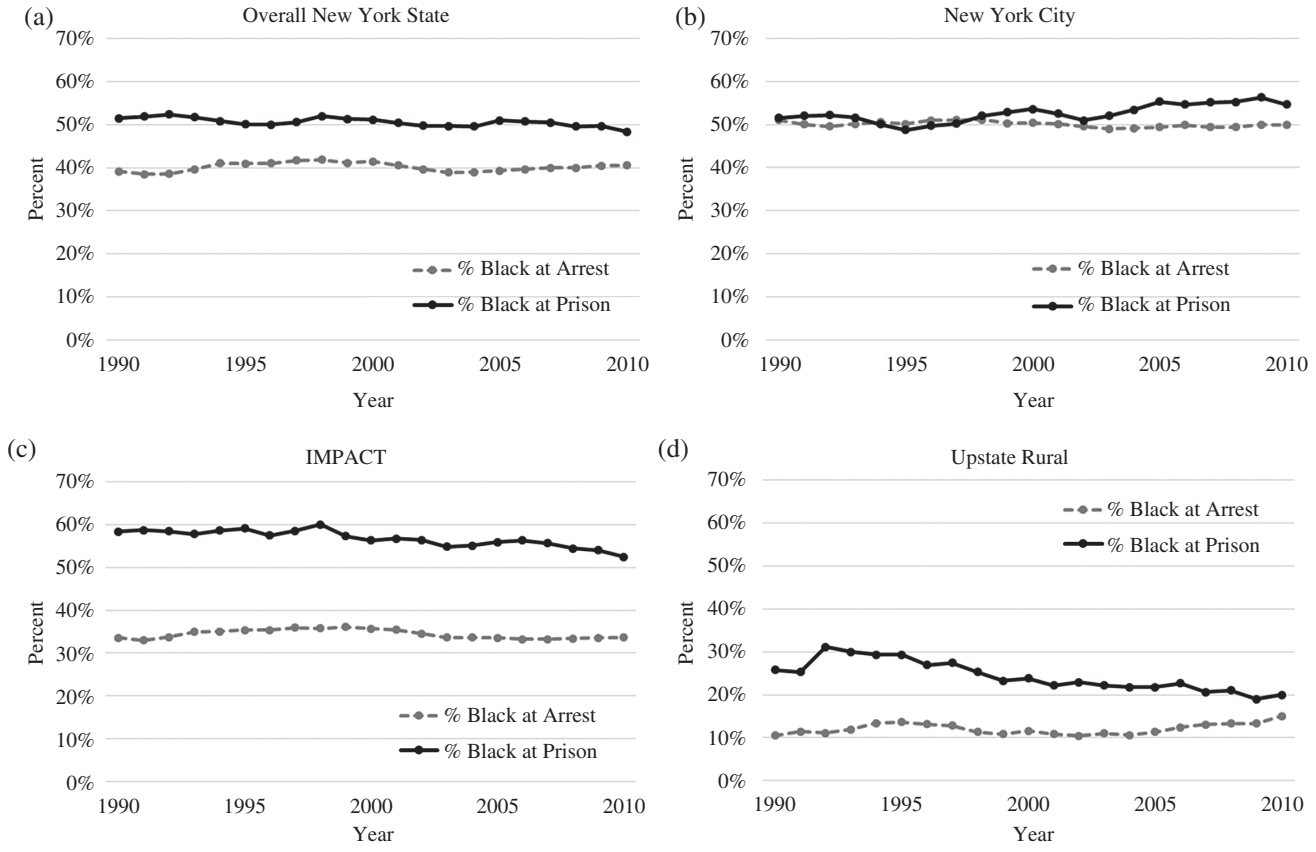
History	Total	Black	Nonblack
No history	35.1%	25.7%	41.4%
Arrested but never convicted	41.1%	44.8%	38.6%
Misdemeanor conviction only	4.6%	2.9%	5.8%
1 felony conviction	10.0%	13.2%	7.8%
2 or more felony convictions	9.2%	13.4%	6.3%
Total	100.0%	100.0%	100.0%

Results

Racial Disparity at Arrest and Prison Sentencing

The racial makeup at arrest and prison sentencing was relatively stable in New York State between 1990 and 2010. About 40 percent of all arrestees and 50 percent of those who were sentenced to prison were black (figure 1a). However, this pattern was not identified consistently in all regions.

In New York City counties, the proportion of blacks in the arrest population remained very stable, near 50 percent, while the proportion of blacks in prison sentencing showed a slight increase from 1990 to 2010 (figure 1b). Moreover, the black-to-nonblack ratio at prison sentencing was very similar to the corresponding ratio at arrest, which was almost 1:1. IMPACT counties, on the



Note: Dashed line refers to the percentage black in the arrest population; solid line refers to the percentage black in the prison sentencing population.

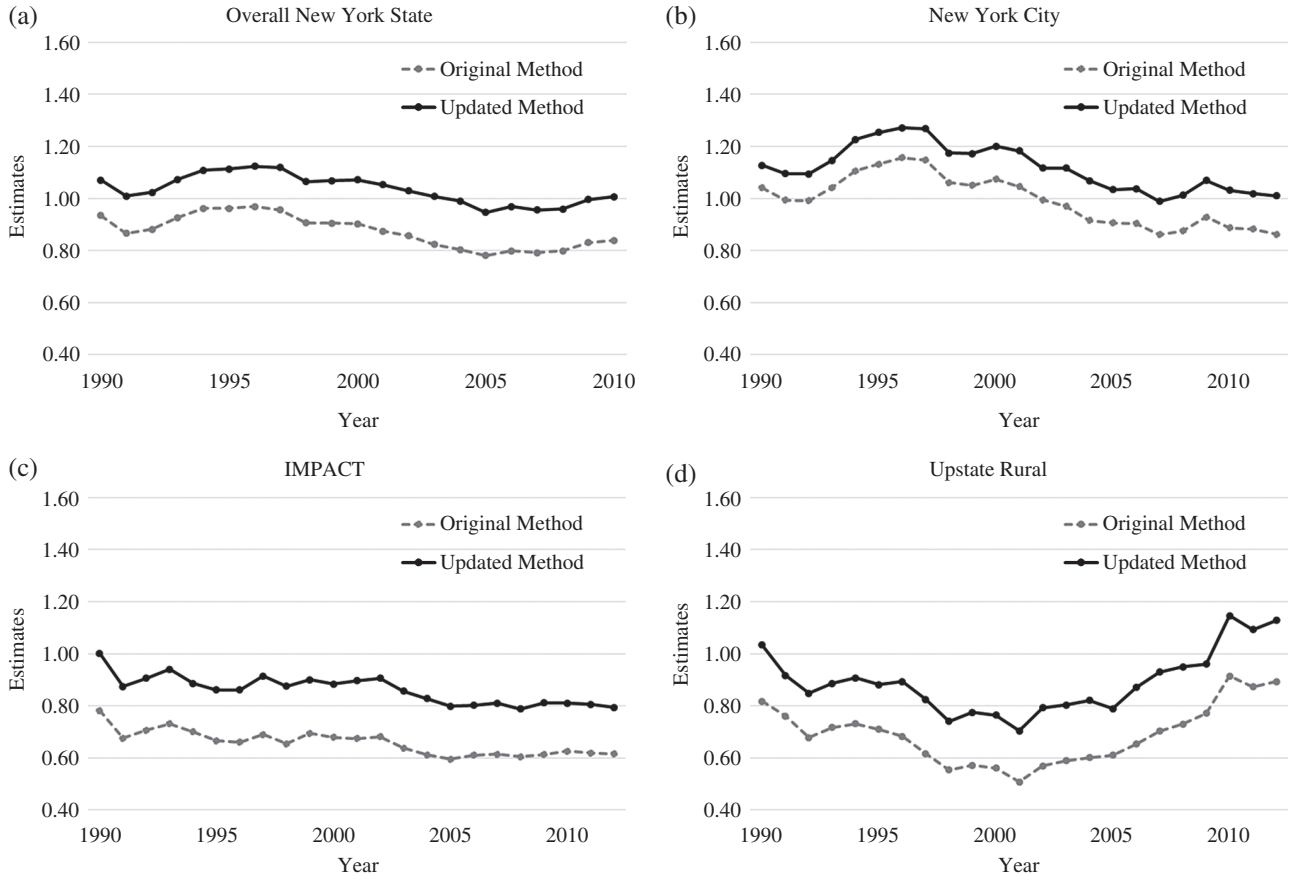
Figure 1 Proportion of Blacks among Arrestees and Defendants Sentenced to Prison

other hand, reported a big difference in their black population at arrest versus prison sentencing (figure 1c). Although only one-third of the arrest population was black, more than half (57 percent) of the prison sentencing population was black for IMPACT counties. In upstate rural counties, where the race and ethnicity of the population is less diverse, the majority of the arrest population was nonblack (figure 1d). One noticeable pattern for this region is that the difference in racial makeup between arrest and prison sentencing became smaller over time. In 1990, the percentage of blacks in prison sentencing was twice the percentage of blacks in the arrest population, but this difference disappeared by 2010. This regional variation shows the necessity of further examination of the sources of racial disparity related to this variation. Note that the regions we used for this study roughly represent a split between urban and rural areas of New York State. While the aims of this project do not speak to the specific reasons why urban and rural areas might see differential treatment by race, something about cities and rural areas is driving the variation we see. We note that poverty, policing strategies, and employment realities are directly linked with urbanicity, which certainly may play an important role in this disparity by region (Crank 1990).

The Extent of Differential Treatment of Race at Post-Arrest Stages

The solid line in figure 2 connects single-year Blumstein estimates of post-arrest system treatment for each region from 1990 to 2010, controlling for crime type and criminal history of individual arrestees. As seen in the previous section, the black and nonblack arrest populations have important differences in criminal history distribution, which, in combination with the crime type, would affect the probability of receiving a prison sentence. Of the arrest population, more blacks (27 percent) had at least one prior felony conviction compared with nonblacks (14 percent), which suggests that blacks might receive unfavorable sentencing outcomes (i.e., prison sentences) partly because of their longer and more serious criminal histories (table 3). Our results support this hypothesis. Compared with the original Blumstein method, which only accounted for racial differences at arrest crime distribution (dashed line in figure 2), our estimates increased, on average, by 0.16. An additional control for criminal history distribution reduces the extent of differential treatment of race at post-arrest case processing.

Table 4 shows estimation results for every five years between 1990 and 2010, which indicate, for each region and year, the extent of post-arrest differential treatment of race of an arrestee. Between 1990 and 2010, the overall state estimates were either close to 1 or slightly greater than 1, which suggests that the racial disparity in prison sentencing can be almost completely predicted by differential involvement as represented by arrest (figure 2a, solid line). This suggests that blacks were equally or even less likely to be sentenced to prison than would be expected based on their arrest distribution.



Note: Dashed line refers to the Blumstein estimates based on the original method; solid line refers to the Blumstein estimates based on the updated approach, which incorporates criminal history in the estimation.

Figure 2 Comparison of Original Blumstein Method Using Our Data to Updated Estimates Using Criminal History, by Year and Region

A separate analysis for the three regions found that there is a clear regional variation in the estimates. In the New York City region, the estimate was always greater than 1, which indicates that the ratio of blacks to nonblacks in prison was smaller than predicted from arrest (figure 2b). The net post-arrest case processing was in favor of blacks between 1990 and 2003. Starting in 2004, the racial makeup in prison sentencing was almost 100 percent predicted by the racial makeup at arrest. Unlike the New York City region, IMPACT counties consistently revealed estimates lower than 1, and the estimates decreased by 0.2 from 1990 and 2010 (figure 2c). In 2010, about 20 percent of the racial disparity in prison was attributed to post-arrest differential system treatment, controlling for crime type and criminal history of the arrest population. Meanwhile, the upstate rural counties showed a completely different trend from the two other regions (figure 2d). Whereas the extent of differential treatment in IMPACT counties increased over time, upstate rural counties showed an opposite trend. Between 1990 and 2001, blacks were more likely to be sentenced to prison than would be predicted from arrest patterns, controlling for crime type and history. Since 2001, however, when 30 percent of the racial disparity in prison sentencing remained unexplained, the extent of differential system treatment decreased over time, and the estimate was over 1 in 2010.

Crime Type-Specific Differential Treatment of Race

To explore whether differential treatment in case processing varies by crime type, we estimated the extent of net system treatment for each crime type in a given region (table 5). Overall, in New York State, estimates of differential treatment for a given crime type were either close to 1 or greater than 1, except assault and other crime types. Blacks who were arrested for an assault or other minor crimes, which take up 40 percent of the entire arrest volume, were more likely to be sentenced to prison than predicted. However, three regions showed disparate patterns in the crime type-specific estimates. In the New York City region, where the estimate was almost 1 in 2010, blacks arrested for sex offenses, fraud, or other minor crimes were more likely to be sentenced to prison than corresponding nonblacks. However, for burglary, drug sale, drug possession, and other driving offenses, blacks received more favorable case outcomes than predicted from arrest patterns. In IMPACT counties, where the estimate was 0.8 in 2010, blacks arrested for sex offenses, assault, burglary, drug sale or possession, and other minor crime were substantially more likely to be sentenced to prison than predicted at arrest. In upstate rural counties, where the estimate was greater than 1 in 2010, blacks were less likely to be sentenced to prison for most charges, except drug sale or possession charges. Blacks who were arrested for drug charges were substantially more likely to be sentenced to prison.

Table 4 Blumstein Estimates Controlling for Crime Type and Criminal History, by Year and Region

	Year				
Region	1990	1995	2000	2005	2010
State total	1.07	1.11	1.07	0.95	1.01
NYC	1.13	1.25	1.20	1.03	1.03
IMPACT	1.00	**0.86**	**0.88**	**0.80**	**0.81**
Upstate rural	1.03	**0.88**	**0.76**	**0.79**	1.15

Note: To ease a visual inspection, estimates that are smaller than 0.95 are in boldface. They indicate that blacks who were arrested for a given charge in a given region had unfavorable case outcomes compared with nonblacks.

Table 5 Crime Type-Specific Estimates of Differential Treatment of Race by Region, 2010

Crime Type	State Total	NYC	IMPACT	Other
Homicide	0.95	0.97	0.97	1.40
Sex offenses	1.09	**0.82**	**0.72**	2.62
Assault	**0.92**	0.96	**0.69**	1.37
Robbery	0.98	0.97	1.00	2.28
Burglary	1.06	1.22	**0.88**	1.79
Basic property	1.26	1.02	1.40	1.56
Drug sale	1.09	1.19	**0.93**	**0.73**
Drug possession	1.03	1.67	**0.50**	**0.70**
Fraud	1.90	**0.91**	1.40	4.52
Driving offenses	2.24	1.24	1.76	1.96
Other	**0.74**	**0.72**	**0.59**	1.02

Note: To ease a visual inspection, estimates that are smaller than 0.95 are in boldface. They indicate that blacks who were arrested for a given charge in a given region had unfavorable case outcomes compared with nonblacks.

Discussion

While there was a consistent decrease in both the arrest and prison population in New York State between 1990 and 2010, the racial composition in each system was fairly stable: blacks represented 50 percent of the New York State prison population, while only 40 percent of the arrest population was black. The goal of the current study was to examine the overrepresentation of blacks in New York State prison sentencing, to identify the source of the racial disparity in the prison population, and to see to what extent policing may explain this disparity. To explore our research questions, we adopted Blumstein's framework (1982) to measure the net extent to which the racial composition in prison is explained by differential involvement (as represented at arrest) of each racial group.

One of our major findings is that most of the racial disparity existing in prison already exists at arrest. Across New York State in 2010, we found that the difference in racial disproportionality between the arrest and prison populations was almost completely explained by the racial differences in crime type and criminal history. Blacks were more likely to be arrested for serious crimes and had longer (and more serious) criminal records that would increase the probability of being sentenced to prison. The interpretation of this result requires caution. This result does not prove that there is no discriminatory practice at the post-arrest stage, but it does suggest that differential treatment in court processing is not likely to be the main source of overrepresentation of blacks in prison. The racial disparity that exists in prison sentencing is, for the most part, already in place at arrest. Therefore, research on the disproportionately high minority representation in prison should focus on understanding arrest practices by law enforcement, as well as the social realities that interact with police practices (e.g., poverty and urbanicity), as important sources of higher incarceration rates among blacks.

It is worth noting that there are multiple decision points between arrest and prison sentencing, and our estimates only consider the beginning and end of this process. Our estimate shows the net extent of differential system treatment in post-arrest case processing, without indicating the extent of differential treatment at any specific decision point. Individual decision points in the court system such as bail setting, plea bargaining, trial, and sentencing are not

necessarily free of differential treatment. Rather, discriminatory practices at a given stage(s) of court processing seem to be balanced by opposite practices in other stages, and courts only marginally increase racial disparity over what is established at arrest. Therefore, several systems are in place to prevent discriminatory practices in courts. Courtroom actors are adversarial to each other by design, which would balance the extent of influence each courtroom actor has on case outcome. Cases with weak evidence would most likely be dropped by the decision of a prosecutor, jury, or judge. Also, judges in New York State are bound by sentencing guidelines that determine the appropriate sentence for those convicted of specific charges and those with specific criminal records, and courtroom actors have established "going rates" that set the expected incarceration outcomes for given crimes, backgrounds, and criminal histories (Ulmer and Johnson 2004). These formal and informal structures together may influence the institutional behavior of courts (Schmidt 2010).

Law enforcement officers, as street-level bureaucrats, have greater discretion in determining who to arrest and in what situations (Lipsky 2010). Oversight mechanisms for racial discrimination exist, such as citizen review boards and body cameras, but police officers still have significant amount of discretion at their disposal. Disproportionately high traffic stops for minorities (Engel and Calnon 2004; Epp, Maynard-Moody, and Haider-Markel 2017; Warren et al. 2006) and the concentration of police surveillance in underprivileged minority communities (Petrocelli, Piquero, and Smith 2003; Withrow 2004) support the important role of law enforcement as a source of disparate treatment by race and as the gatekeeper to the criminal justice system. We cannot test this possibility within our data capacity, but our findings stress the necessity of data collection efforts in policing as well as data on baseline levels of criminal activity. Our findings indicate that police interactions with general public casts a long shadow, and the effect of policing lasts throughout case processing.

Separate analyses for three New York State regions clearly demonstrate that there is regional variation in the extent of differential system treatment. In New York City, where the arrest rates for blacks are very high relative to other places, blacks are less likely to be sentenced to prison than nonblacks. This suggests that in New York City, the net effect of court processing on incarceration decisions is more favorable to blacks when we account for the crime type and the criminal history of individual defendants. This finding is supported by other studies that demonstrate that black and Latino defendants are more likely to benefit from case dismissals, even though they are more likely to be detained pretrial and to receive a custodial plea offer (Kutateladze et al. 2014; Spohn 2008). In IMPACT counties, where most of the non–New York City arrests are concentrated, more blacks are being sentenced to prison than expected, after controlling for crime type and criminal history of individual defendants. Although the extent of differential treatment is not large, the pattern of increase in the extent of racial disproportionality indicates a concerning change in court processing in non–New York City urban regions. Upstate rural counties, where a majority of the population is nonblack, showed very different trends from the other regions. Case processing by courtroom actors consistently disfavored blacks in the 1990s, but the net extent of system treatment decreased from 2001, as blacks were getting more favorable outcomes in incarceration decisions.

Future research focusing on understanding this regional difference will contribute to the discussion on the differential system treatment by race of an arrestee. Specifically, we call for research to identify why New York City courts appear to be biased *against* whites and whether this effect is detected in our study because of police practices such as stop and frisk. We speculate that the highly disparate arrest rates brought about by stop and frisk left New York City courts with many black and minority defendants with poor evidence against them. We also encourage researchers to focus on how one's criminal history is accumulated and whether there are any racial differences in this process. Criminal histories, if established under racially biased treatment, could be simply casting a lagged shadow of racially disparate treatment in the process of accumulating criminal history. It is also worth examining whether there is any systematic bias in police practices in terms of the classification of crimes. If the exact same behaviors are leading to different crime classifications by police, this bias would be undetectable in our estimation.

Conclusion

To understand the source of racial disparity in prison population, we need to take a holistic approach which considers both front and back ends of criminal justice processing. Our study findings suggest that the decision made at the arrest stage is still the predominant influence on racial disparity in prison sentencing. Courts only marginally increase racial disparity over what is already established at arrest. This readdresses the importance of law enforcement officers as the gatekeeper to the criminal justice system. Given the critical role of law enforcement officers throughout the justice system, the use of police discretion at arrest deserves a comprehensive examination. In particular, investigatory police stops in which police officers have greater discretion should be examined as a key source of racial disparities (Epp, Maynard-Moody, and Haider-Markel 2017). Advances in our understanding of racial disparity would start by acknowledging the importance of data collection efforts by practitioners. Comprehensive and reliable policing data on investigatory stops are not easy to obtain. Records for the cases with no legal consequences are often incomplete, and information such as the race of the citizen and the reason for the stop are often missing. Institutional efforts to keep reliable records on stops and searches will help us understand whether and how racial disparity at arrest is initiated, which will help guide institutional reform on policing practices.

Disclaimer

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Notes

1. New York State open data, https://data.ny.gov/Public-Safety/Adult-Arrests-by-County-Beginning-1970/rikd-mt35.
2. New York City counties: Kings, Queens, New York, Richmond, and Bronx; IMPACT counties: Albany, Broom, Chautauqua, Duchess, Erie, Monroe, Nassau, Niagara, Oneida, Onondaga, Orange, Rensselaer, Rockland, Schenectady, Suffolk, Ulster, and Westchester; upstate counties: all other counties in New York State.
3. Our crime categories are different from those in Blumstein and other previous literature. Blumstein's approach, along with other replication studies, used 11 crime categories based on UCR reports: murder, manslaughter, sexual assault, robbery, assault, burglary, larceny, auto theft, fraud, drug, and other offense. We have separate categories for drug possession and drug sale, and DWI/DUI offense categories in addition to these.
4. The expected proportion of black and nonblack prisoners can also be estimated using a regression model. A description of this method and results using regression analysis are presented in the appendix.

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Appendix: Comparison of Blumstein Estimates to Analogous Regression Analysis

The Blumstein estimate (X) is calculated by comparing the ratio of expected black to nonblack in prison to the ratio of actual black to nonblack in prison (see equation 1). The expected ratio of black to nonblack in prison ($R/[100 - R]$ in equation 1) can be estimated from the regression model with crime type and criminal history dummies as predictor variables. Note that the race dummy is not included in the model. We first get the intercept and coefficients of predictors when race does not play a role in receiving a prison sentence. Then we get the predicted probability of prison sentence for blacks multiplied by the proportion of black for each crime type and criminal history and for nonblacks, respectively ([e] in table A1). We then multiply this predicted probability by the actual number of blacks to get the expected total number of blacks in prison ([f] in table A1). Finally, the Blumstein estimate is calculated from the expected ratio of black to nonblack divided by the actual ratio of black to nonblack. The estimates calculated using a regression model are identical to those we got from the traditional Blumstein approach.

$$Y_i = \beta_0 + \beta_1(Crime\ Type)_i + \beta_2\ (Criminal\ History)_i + \beta_3(Crime\ Type)(Criminal\ History)_i + \varepsilon_i$$

Table A1 Estimating Percentage Black in Prison Assuming No Post-Arrest Discrimination Using a Regression Model, 2010 Arrest Cohort

	Actual Number		Crime Type		Crime Type * Criminal History	
	(a) Arrest N	(b) Prison N	(c) Expected P(prison)	(d) Expected N prison	(e) Expected P(prison)	(f) Expected N prison
Black	234,555	7,941	0.031	7,967	0.034	7,967
Nonblack	343,872	8,254	0.026	8,228	0.024	8,228
Ratio of Black to nonblack	0.962		0.806		0.968	
Blumstein estimate			0.806/0.962 = **0.84**		0.968/0.962 = **1.01**	